

Minutes of CAL s/w telecon

J. Eric Grove

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I couldn't connect to vrvs, so I joined the conference late by regular telephone. Hey, that little plastic device has great full-duplex sound and works reliably!

Further work on integral linearity

Grove

I reported to calsoftlist that I now have a complete list of channels that exhibit significant "stretching" of the gain scale in the LEX4 range in the bottom couple hundred bins, i.e. near or throughout the muon peak. This stretching is detected in charge-injection calibrations between the pedestal value and the small-input charge-injection values: the difference between pedestal and small-input changes on long timescales (week to week or month to month), but the remainder of the gain scale is relatively unchanged. This is not just a gain change or pedestal shift.

In an email exchange with Sacha, I wrote the following description. I hope this is clear without the surrounding context.

For two different chg calibrations, taken at different times but with identical procedure and analyzed in identical ways,

SmallPulse - Pedestal shows some large changes, mostly no changes.

BigPulse - Pedestal shows some large changes (in fact the `_same_` change as

SmallPulse - Pedestal), mostly no changes.

BigPulse - SmallPulse shows no changes!

So, there's changing curvature near pedestal, while the absolute difference between small and large inputs remains constant.

Conclusions:

1. The LEX4 intlin model in `tb_recon` is good for dates near 13 Jan 2000, but clearly not for other dates.
2. The LEX4 muon gains in `tb_recon` are suspect; thus all gains are suspect. This could be the source of the ~10-15% overestimate of the total energy in randomly chosen 20 GeV e^+ runs.

Actions:

1. (Grove) Study the LEX4 gain "stretching" as a fcn of time. Derive correction factors and new muon gains.

Optimizing correction factors for Run 138

Arache

We've chosen run 138 (20 GeV e^+) for analysis in the beamtest paper. Arache reported that he now sees the 10-15% overestimation of the total energy in `tb_recon` we discussed a couple weeks ago. He reported that the recon plots they've shown in the past (the ones that gave 20 GeV as the total energy, nicely enough) used *no* gain or intlin corrections on the input data. When he adds the "corrections", he too finds the overestimated total energy.

Conclusion:

1. We all agree that we need to continue to improve the gain and linearity corrections before we publish results in the beam test paper.

Disagreement between tbsim and tb_recon

Dubois

Richard reported that the factor-of-two disagreement between energy scales in tbsim and tb_recon still exists.

Error in TBSim total energy output

Arache

The factor of 1.5 in ROOTwriter has been removed. See discussions on calsoftlist. Arache and Thomas reported the history of removing a scale factor of 1.5 in the calorimeter energy. (Sorry Arache, it's so much shorter to type your first name than your last. Hope you don't mind.). Arache wrote

```
> 1- The Energy estimator (CsI_Energy_Sum) is not correct for
> simulated data coming from TBSim and Rooted by ROOTWriter :
>
> ROOTWriter multiplies by a factor 1.5 before writing the energy
> into the Root file. This is incorrect.
```

Switch in tb_recon for simulated data

Arache

There are now input files for analyzing simulated data with tb_recon. CsI bars have identical slopes, null pedestals, constant gains, and no nonlinearities. Arache wrote to calsoftlist:

```
> 2- To process Simulated data, one should use the following set of
> calibration files :
>
> mu_slopes_sim.txt (replacing mu_slopes.txt in centella.in)
> pedestal_sim.txt (replacing calorimeter.calib in centella.in)
> fC_to_MeV_sim.txt (replacing fC_to_MeV.txt in centella.in)
> intlin_sim.txt (replacing intlin.txt in centella.in)
>
```

Preparation for s/w review

Arache, Eric

Arache and I have been exchanging email and telephone discussions about the s/w review, preparing transparencies, discussing tasks, etc.

Actions:

1. (Eric and Arache) Complete the CAL s/w review.

Previous Action Items

1. (Grove) Review CAL beam test paper goals. **Done.**
2. (Giebels and Lindner) Proceed with the two-step gain calibration.
3. (Giebels) Verify our understanding of trigger logic and timing for muon runs in clean room after ESA with Gary Godfrey. **Done.**
4. (Grove) Fit GSI intlin data. **Done.**
5. (Grove) Improve fits to SLAC intlin data. **Range 2 (HEX8) is fine; others are under review.**
6. (Grove) Get more info on upstream material, beam aperture from GSI.
7. (Grove) Generate simple saturation curve from muon, C, and Ni points in a few bars. **First pass done, will repeat.**
8. (Sandora) Complete electronic and source calibrations of Test Box crystals. **Summary memo in progress.**
9. (Tylka) Improve interface to dE/dx and partial cross-section routines from CREME96.
10. (Grove) Write first version of CAL section of beam test paper. **In progress; expect to distribute draft first week of September.**
11. (Giebels and Linder) Simulate run 138 with tbsim. **Done. Summary results in preparation.**
12. (Grove) Continue improvement of gain scales in HEX8 for run 138, incorporating expected signal from simulation. **In progress.**
13. (Giebels) Resolve discrepancy in simulations of MIPs. **In progress.**
14. (dCeS) Distribute list of runs and plots of total energy to calsoftlist so we can all play this game of Name That Total Energy. **OBE. We all see the discrepancy.**
15. (Chekhtman) Implement switch in tbrecon. **Done.**